ENGINEERING ABSTRACTS

IT CAN'T BE DONE

"TRISECTING the angle with ruler and compass alone is just as impossible today as it was in the days when the ancient Greek mathematicians worried over the problem centuries ago." This statement is from a group of mathematicians commenting on the recent reports that the problem had been solved.

There are a few special angles that can be trisected by use of the compass and straight line. When claims are made that the angle has been trisected by use of plane geometry alone, it turns out that one of these special angles has been used or else there is some error in the work.

By using special curves such as the conchoid or the quadratrix of Hippias, trisection of the angle is possible, but the use of these three-dimensional curves was frowned upon as unsportsmanlike by the Greek mathematicians, and the solution by the conic section method was not considered a true solution of the problem.

Trisecting the angle, squaring the circle, and duplicating the cube were the three problems that started the Greek mathematicians on the way to the discovery of many important results in mathematics. During the centuries since their time, many thousands of attempts have been made to solve these problems.—*Science Service.*

AIRPLANE INVENTION USED ON AUTOS

THE USE of doughnut or "air-wheel" tires, the super-balloon types taking from 10 to 20 lbs. of air pressure, is being extended to automobiles and trucks, since they have been used with success on airplanes and on airport and golf-course tractors. Advantages claimed for these tires include greater riding comfort, twice as much surface on the road, with consequent greater traction and less tendency to skid, and added mileage. General adoption probably will involve redesigning of wheel and axle assemblies and the improvement of steering mechanism. Hydraulic steering has been used on trucks fitted with doughnut tires.—*Popular Mechanics.*

A LOCOMOTIVE TO HANDLE DIRIGIBLES

ONE OF the most important problems to be solved in making the airship practical lies in the task of ground handling. Strange to say, a locomotive comes to the aid of the airship. This locomotive, built for the Navy by the H. K. Porter Co., will operate on a circular track around the mooring mast of an airship, in front of the hangar at Lakehurst, N. J. The locomotive is powered with a 250 horsepower, eight-cylinder gasoline engine.

The locomotive pulls a large beam, to which the stern of the airship is held by yaw lines, until the dirigible assumes a position parallel to the hangar. In the performance of this bit of work the locomotive takes the place of a thousand men.

A special feature of the design is that the locomotive has a height of only six feet. The top is smooth so that there will be no projections on which the airship can catch. The hydraulic transmission permits absolutely smooth performance without jars or jerks.—*Scientific American.*

200,000 AMPERES ON A RAMPAGE

PRACTICALLY everyone has noticed the attraction and repulsion between two horseshoe magnets, but few people realize the tremendous mechanical forces on modern electrical equipment when it is carrying a large current, and setting up a strong magnetic field.

In a recent test, 200,000 amperes of alternating current was passed through a piece of electrical apparatus. Although the apparatus stood this flood of current, the power leads, as thick as a man's wrist, writhed and twisted about like monster reptiles in agony.

Then the current was shut off and pieces of felt laid between the leads, which kept them two inches apart. Then every few inches, they were tied together with two-inch rope. When the current was again passed through them, the ropes were parted like so much twine.

It was found that the force between the cables reached a value of 10,000 pounds for every foot the cables were tied together. Not only that, but since it was alternating current, this force was pulsating at the rate of 120 times a second; that is, the force reached a maximum and dropped to zero 100 times in the duration of a heart beat. Small wonder, then, that the ropes broke!—*Scientific American.*

SEAMLESS CASTINGS

IN SAND casting it is necessary to form the undercut places with false cores, producing seams on the casting which have to be removed by costly chiseling.

In a new German process recently introduced into this country, this work is eliminated by covering the pattern with a plastic paste which will become elastic after a cer-

KELLETT AUTOGIRO

GEORGE WASHINGTON BRIDGE *Courtesy Engineering News Record*

tain time. The pattern may then be removed from the mold without spoiling it. The mold is then put back in its original position until it hardens. Then it is placed in an ordinary molding box, the customary inlets, pouring gullets, and vents being cut, and the mold then dried and burned.

Castings made in this way are seamless, very smooth, and further finishing is seldom necessary. Very complicated castings may be made by this process and are said to be much cheaper than those produced by sand castings.—*Scientific American.*

PEACE USE OF WAR MATERIAL

DEVELOPED primarily for army use, G. B. has found an effective road barrier for stopping fleeing auto bandits, which is nothing more substantial than a roll of light wire. The wire coils, about 4 ft. in diameter, weighing less than 50 lbs., and stretching about 60 ft., were found to block roads so swiftly that armored cars and trucks were stopped dead in their tracks. The roll of wire is known as a "fence concertina" and is stretched across the road at a point where it is desired to stop a car. The secret of its efficiency lies in its ability to tangle. When a car runs through it, the coil stretches and then breaks, the loose strands twisting about the wheels, winding into the steering gear, working into the brake drums and around the axle and usually finishing the job by completely jamming the engine.

MODERN COAL FOR MODERN MARKETS

IN THE early days of industry, coal was used just as it came from the ground. There were several disadvantages to this use, the chief being that the fuel burned poorly. The Pittsburgh Coal Company was the first to use a method of cleaning and treating coal on a large scale.

This company uses two processes: the "wet" and the "dry." In the "wet" process, the raw coal is first separated into various sizes. The larger sizes need no treatment, but the "minus 4-inch coal" is cleaned in washers called Rheolaveur launders. After being washed, it is rinsed and dried. At this point it is furnace, stove, stoker, pulverized, and slack sizes.

The fine coal is passed, with the water, into settling tanks, where most of the water is removed. Centrifugal driers reduce the amount of moisture considerably before the coal is completely dried by hot gases.

In the dry-cleaning process, air is the cleaning agent. After it has been screened, the coal passes through cyclone separators which remove most of the dust and impurities. In this plant, 900 hp. is needed to treat 320 tons of coal per hour.

In both processes the coal is sampled automatically. Every shipment of coal is tested thoroughly and must be proven satisfactory before it is sent to the consumer.—*Scientific American,* December, 1931.

POLAND BECOMES A MARITIME NATION

IT HAS always been the dream of Poland to have a seaport and thereby develop a merchant marine. It was not until after the World War that she had great hopes of realizing this. Then she received by the treaty of Versailles the use of the free city of Danzig. However, due to the influence of Russia, she lost shipping privileges at Danzig so was forced to find a suitable spot near by. After considerable study the small village of Gdynia was selected. Contracts were let to German and French firms for the construction of a mole or jetty 2428 feet long; a breakwater 4039 feet long; a second mole 18,553 feet long; and a pier head.

There were two systems used in constructing the jetties. One was the sinking of piles, and the second was the construction of reinforced concrete caissons. The construction of these projects was a task involving great engineering skill.

Due to the facilities of the port, Poland's maritime commerce has increased by leaps and bounds during the past few years, and it is expected to increase still further. The village of Gdynia has grown until it is a city of 30,000 people.—*Scientific American,* December, 1931.

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4. Subscriptions will be offered for the remainder of the school year at the reduced rate of seventy-five cents for the remaining five issues. Subscriptions taken for next year 1932-33, at the regular price of one dollar, will also be counted in the contest.

5. Each subscription will count a number of points according to the following scale:

Student Subscription	100 Points
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6. Only paid subscriptions will be acknowledged.

7. The purpose of the contest is to increase the present circulation of The Ohio State Engineer to at least 33 per cent of the Engineering College enrollment. The prizes will be awarded February 15th if 33 per cent has been obtained. If not the time of the contest will be extended according to the discretion of the judges.

8. The prizes will be awarded by a board of judges composed of Dean E. A. Hitchcock, Professor John Younger, Miss S. A. Harbarger, The Editor and Business Manager.

9. Further inquiries are referred to the Office of the College of Engineering, Room 120, Chemistry Building.